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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,284	10/02/2000	William L. Goodman	GRI-00-016	4279

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EXAMINER	
VARTANIAN, HARRY	

ART UNIT	PAPER NUMBER
2634	8

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/677,284	GOODMAN ET AL.	
	Examiner	Art Unit	
	Harry Vartanian	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☒ Claim(s) *9 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 2, 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Petranovich(US Patent 5,625,652). Regarding Claim 1, Petranovich meets the following limitations of the Claim:

> In a digital communications system having a transmitter for transmitting information in a form of a phase shift keyed signal, said signal being divided into a plurality of windows**(fig 9),** each said window being offset in time**(fig 9)**, and a receiver for receiving said information, a demodulator comprising:
>
> conversion means for converting said phase shift keyed signal**(column 4, lines 23-30)** into a plurality of successive outputs**(Column 8, Lines 11-21)**,
>
> each said successive output being representative of a phase and amplitude of said phase shift keyed signal over additional sets of windows and carrier phases, and each said additional set having different offsets in time and carrier phase from the other said additional sets; **(Column 4, lines 49-64); (Column 8, Lines 22-35)**
>
> estimation means for using said plurality of signals to estimate said carrier phase and said window offsets of said phase shift keyed signal, wherein said carrier phase and window offsets are synchronous; and**(Column 4, lines 23-30), (column 16, lines 38-62)**
>
> decoding means for decoding said phase shift keyed signal back into digital data using said estimates. **Abstract**

More specifically, Petranovich shows the use of windowing to lock onto the timing of the incoming signal. With each incoming burst, the window is adjusted so that the bits are recovered in the right position and the value of the carrier phase is correct. Therefor the carrier phase and window offsets are synchronized. This is necessary in PSK in order to detect the correct symbols, especially in higher order PSK (for example QPSK) where slight offsets can cause the demodulator to decode the wrong symbol.

Regarding Claim 2, the reason for rejection of Claim 1 above also applies here.

Regarding Claim 3, Petranovich meets the following limitations of the Claim:

> wherein a distribution of bit values received for a set of possible said window offsets and carrier phases is measured and a most likely said window offset and carrier phase are selected. **(Column 8, Lines 26-35); Claims 1 and 2;**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petranovich(US Patent 5,625,652) in view of Matsumoto(US Pat #4,763,331). Petranovich meets all the limitations of Claim 4(Please see above paragraphs) expect the use of maximum increasing function of absolute value for window offset estimation.

However, Matsumoto discloses a "...decoding method according to claim 3, wherein the reliability information is a monotonic increasing function of the absolute value of a difference between the two summations."(Claim 5) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Petranovich PSK detector use a maximum increasing function of absolute value for window offset estimation in his receiver. The motivation to do combine is that increasing function of absolute value is a common statistical measurement method to measure error.

2. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petranovich(US Patent 5,625,652) in view of Eastmond et al(US Pat #6,088,337). Petranovich meets all the limitations of Claim 5(Please see above paragraphs) expect the use of maximum sum of squares for window offset estimation.

However, Eastmond et al discloses "a function of the sum of the squares of the out-of-phase autocorrelation, are commonly used to determine good synchronization words"(Table 2) for his invention. Regarding the limitation of comparing the sum of squares to a "theoretical" value, Petranovich discloses that the phase error is compared to a predetermined threshold. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Petranovich's PSK detector use sum of squares for measuring and comparing the results of his window offset estimation. The motivation to do combine is sum of squares is a common statistical method to measure error.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petranovich(US Patent 5,625,652) in view of Kumar(US Pat #5,966,401). Petranovich meets all the limitations of Claim 6(Please see above paragraphs) expect the use of maximum sum of absolute values for his window and carrier phase detection.

However, Kumar discloses a receiver where "the correlation sums 31 and 33 are propagated to the absolute-value functions 35 and 37, respectively, which remove the polarity information from the correlation sums by discarding sign-bit information."(Column 7, Lines 1-5) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Petranovich's PSK detector use a maximum sum of absolute values for measuring and comparing the results of his window offset estimation.

The motivation to do combine is sum of absolute values is a common statistical method to measure the error of a number.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petranovich(US Patent 5,625,652) in view of Shenoy et al(US Pat #5,297,172). Petranovich meets all the limitations of Claim 7(Please see above paragraphs) expect the step of minimizing BER for his window and carrier phase detection.

However, Shenoy et al discloses a PSK receiver where "In almost all digital data transmission systems, the receiver is required to sample the received waveform once per symbol in a relatively small interval in order to minimize the bit-error-rate (BER)." (Column 1, Lines 15-22) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Petranovich's PSK detector use a minimization of BER for measuring and comparing the results of his window offset estimation. The motivation to do combine is BER is common metric used to determine the quality of a received signal and decoding method.

Allowable Subject Matter

5. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Vartanian whose telephone number is 703.305.8698. The examiner can normally be reached on 9-5:30 Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703.305.4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harry Vartanian
Examiner
Art Unit 2634

HV

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600